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[54] A wrapping method

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What is claimed is:

A wrapping method, characterized in that a target object is wrapped with a wrapping sheet prepared by laminating a uniaxially oriented polyethylene film sheet and an unwoven fabric of a polyolefin series fiber oriented extremely in a single direction one upon the other with a polyolefin series adhesive interposed therebetween such that said polyethylene film sheet and said unwoven fabric are oriented in the same direction, followed by heating said wrapping sheet so as to permit the wrapping sheet to shrink in a single direction and, thus, to wrap said target object.

Detailed Description of the Invention:

The present invention relates to a wrapping method that permits

wrapping tight only that portion which requires wrapping with a shrinkable film. Where a target object is wrapped with a conventional shrinkable film, it is certainly possible to achieve a tight wrapping in the case where the target object to be wrapped does not include a sharp edge portion and, thus, is smooth. However, where the target object includes a sharp edge portion, some problems remain unsolved. For example, the wear resistance of the corner portion of the target object is low and tends to be torn easily. It is impossible to overcome these problems by simply increasing the thickness of raw material goods of the wrapping film.

Breakage of the wrapping sheet is brought about partly because a corner of the wrapped target object provides the fulcrum about which the wrapping film is shrunk and partly because that portion of the wrapping film which is in contact with the corner portion of the target object is made thinner.

As a result of an extensive research on these drawbacks, the present inventors have found a wrapping method using a wrapping sheet, which wraps only a required portion, which exhibits a wear resistance, is unlikely to be torn, and is small in change with temperature in the performance even where the target object to be wrapped is shaped to have a sharp corner portion.

That is, the wrapping sheet used in the present invention is prepared by laminating a uniaxially oriented polyethylene film sheet and an unwoven fabric of a polyolefin series fiber oriented extremely in a single direction one upon the other with a polyolefin series adhesive interposed therebetween such that the polyethylene film sheet and the unwoven fabric are oriented in the same direction. The target object is wrapped with the wrapping sheet thus prepared to have an allowance in alignment with the direction of the target object requiring the wrapping, followed by applying a heat treatment to permit the wrapping sheet to shrink in one direction and, thus, to obtain tight wrapping.

More particularly, the wrapping sheet used in the present invention is prepared by laminating a polyethylene film sheet uniaxially oriented to a large extent and an unwoven fabric oriented to a large extent one upon the other with a polyolefin series adhesive interposed therebetween such that the polyethylene film sheet and the unwoven fabric are oriented in the same

direction. The unwoven fabric is prepared by subjecting a cotton-developed layer of a polyolefin series fiber such as a polyethylene or polypropylene fiber to such methods as needling and paper-making, followed by stretching the unwoven fabric to permit the unwoven fabric to be oriented to a large extent. Hereinafter, this prepared unwoven fabric is simply referred to as "woven fabric".

In preparing the wrapping sheet of the present invention, it is necessary to laminate the uniaxially oriented polyethylene film sheet and the unwoven fabric one upon the other with a polyolefin series adhesive interposed therebetween such that the orienting direction of the uniaxially oriented polyethylene film sheet is made equal to that of the unwoven fabric in order to permit the wrapping sheet to be shrunk in one direction in wrapping the target object so as to wrap the target object strongly and tight. Where the orienting direction of the uniaxially oriented polyethylene film sheet is not made equal to that of the unwoven fabric, the shrinking force of the wrapping sheet is weakened because the polyolefin film sheet and the unwoven fabric differ from each other in the orienting direction, resulting in a failure of wrapping the target object tight. Also, where a biaxially oriented polyethylene film sheet is used in place of the uniaxially oriented polyethylene film sheet, an undesirable phenomenon is generated because the film sheet is shrunk in two directions. For example, where the surface of a target object such as a pipe, a wooden rod or a roller is wrapped, both of the side edges of the target object are exposed to the outside. Also, at the shrinking stage, a deviation is generated between the film sheet and the unwoven fabric so as to lower the shrinking force of the wrapping sheet, resulting in a failure of achieving a tight wrapping.

A polyolefin series adhesive is used in the present invention. However, the adhesive need not be formed of a single material. For example, an ethylene-vinyl acetate copolymer can also be used as an adhesive. By bonding the uniaxially oriented polyethylene film sheet and the unwoven fabric having the same orienting direction with a polyolefin series adhesive so as to prepare an integral structure, the shrinking behavior can be substantially the same, thereby performing the thermal shrinking smoothly and strongly. As a result, tight wrapping can be achieved easily.

As for a wrapping method, the target object is wrapped with the wrapping sheet with 10 to 20% of allowance imparted around the target object in alignment with the direction in which the shrinking is required, followed by applying a heat treatment at a temperature not higher than the melting point, which is not lower than 100°C, of polyethylene so as to achieve shrinking. Furthermore, referring to the accompanying drawings, Fig. 1 shows a wrapping method for wrapping only the side surface of a round rod. As shown in the drawing, the round rod is wrapped to have an allowance with the wrapping sheet of the present invention such that the axis of the round rod intersects with the shrinking direction of the wrapping sheet of the present invention. Fig. 2 shows the state after the wrapping sheet is shrunk by the heat treatment. As shown in the drawing, only the required portion is wrapped tight.

The present invention will now be described with reference to an Example.

Example:

A wrapping sheet was prepared by using three kinds of the raw materials given below.

Polyethylene film: A uniaxially oriented film (having a thickness of 220 μm) stretched 5.0 times as much as the original size in a direction of the vertical axis;

Unwoven fabric: A card web of Byren (registered trade mark of polypropylene fiber manufactured by Mitsubishi Rayon K.K.) consisting of 100% of cotton, having a METSUKE amount (weight of a sheet per one square meter) of 150 g/m^2, and sized 1.5 deniers × 51 mm was entangled by needling to prepare a sheet having a thickness of 2 mm, followed by stretching the sheet to impart a uniaxial orientation to the same and, thus, to obtain the unwoven fabric; and

Adhesive: JQ-7197 (trade name of polyethylene-vinyl acetate copolymer manufactured by Nippon Unichika K.K. and having a thickness of 30 μm.

A wrapping sheet was prepared by laminating the three kinds of the raw materials given above one upon the other. Then, a bundle of 100 wooden pipes was wrapped with the wrapping sheet thus prepared to have an allowance of 15% around the bundle, followed by applying a heat

treatment to the wrapping sheet at 150°C for 60 seconds, thereby wrapping only the side surface of the bundle tight.

Brief Description of the Drawings:

Fig. 1 shows the wrapped state before the heat treatment;

Fig. 2 shows the tightly wrapped state after the heat treatment; and

Fig. 3 shows the shrinking behavior of the wrapping sheet of the present invention.

The reference numerals given in the drawings are: 1, target object to be wrapped; 2, wrapping sheet of the present invention; ← →, stretching-orienting direction; 3, shrinking behavior in a longitude direction of uniaxially oriented polyethylene film; 4, shrinking behavior in a latitude direction of the uniaxially oriented polyethylene film; 5, shrinking behavior in a longitude direction of the wrapping sheet of the present invention; and 6, shrinking behavior in a latitude direction of the wrapping sheet of the present invention.

[56] Reference

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Fig. 1

Fig. 2

Fig. 3

Shrinking rate

Steam treating temperature

Fig. 1
第 1 図

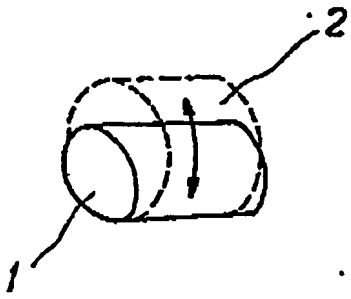
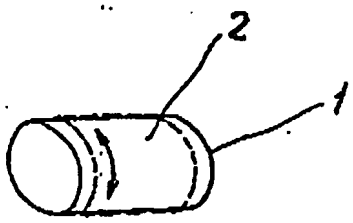
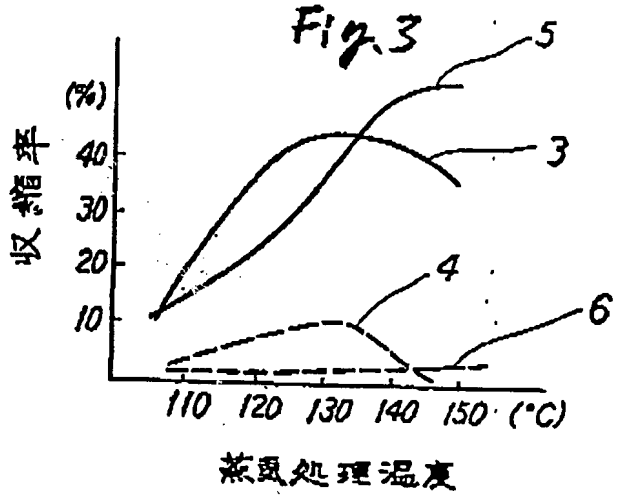


Fig. 2
第 2 図



第 3 図
Fig. 3



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